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Evaluation of the efficiency of Livestock Guarding Dog: use of behavioral observations

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Abstract

The reappearance of the wolf on the western Alps has presented again the problem of coexistence between wolf and sheep farmers and has highlighted issues related to a livestock system evolved without predators. Piedmont Region has started a project for the pastoral integration of the Livestock Guarding Dog (LGD), in collaboration with the Orsiera Rocciavre Natural Park (Turin, Italy). The aims of this research were to evaluate the efficiency of a group of LGD introduced in three flocks in the Park and to assess their impact on wildlife and mountain tourism. The tested LGD showed any aggressive behaviour towards people or other dogs and any negative reaction to different situations and the three basic behaviours of this kind of dogs. All these reasons suggest an effective possibility for the use of LGD inside Alpine areas.

Introduction

Livestock farmers have developed over millennia appropriate measures to protect the flocks. The traditional methods are the presence of the shepherd during the pasture time, the night confinement of the flock and the use of LGD. The almost total wolf extinction at the beginning of the century, caused a slow and inexorable

abandonment of any form of protection of livestock, including the use of these dogs. During the last decade the wolf reappeared in those territories in which was removed and a natural recolonization also in French-Italian Western Alps, made again actual the problem of coexistence between wolves and farmers, underlining the issue related to a system of pasture evolved without predators. Piedmont region in

reason to manage a stable coexistence between wolves and economic activities has started a project for the integration of LGD, in collaboration with the Orsiera Rocciavre Natural Park (Turin, Italy).

The aims of this project were (1) the establishment of a specific breed ethogram and the evaluation of the efficiency of a group of subjects introduced in three flocks and (2) the assessment of these dogs impact on wildlife and mountain tourism.

Study Area

The study involved three sheep and goat livestock (flock), all affected in last years from attacks by wolves or stray dogs, located in three alpine valleys of the Turin Province: Chisone Valley (Flock A), Germanasca Valley (Flock B) and Sangone Valley (Flock C) (Figure 1).



Figure 1. Study Area: Flock A Chisone Valley; Flock B Germanasca V.; Flock C Sangone V.

Materials and methods

Selected dogs for the study were 7 (4 males and 3 females, aged between 1 and 3 years): 6 dogs were Maremma Shepherd Dog, included in the "Project for the integration of LGD" in the Orsiera Rocciavre Natural Park and a mixed breed subject (Maremma Shepherd Dog x Pyrenean Mountain Dog), external to the project, because on property of the shepherd. The observations were conducted during the summer (June-September). The LGD were followed for five days a month for four consecutive months. In total, each subject was observed for 20 days, with about 8-10 hours of daily observations. Using appropriate sampling techniques (**scan sampling** for the ethogram and **behaviour sampling** for the interactions) useful data were collected on first draft of the specific breed ethogram and the development of a protocol used to estimate the canine performances. The evaluation was useful for analyzing basic behaviours considered typical of LGD (Coppinger and Coppinger 1978, Coppinger et al. 1983, Lorenz and Coppinger 1986): attentiveness (the ability to remain close to the flock), protectiveness (the ability to actively respond to any sudden stimulus like the arrival of a predator) and trustworthiness (the absence of predatory instincts directed to

Observations	Rest	Position	Moving	Searching	Guard	Interaction	Alimentation	Grooming	Total
N°	183	633	573	455	20	58	14	11	1947
Freq. %	9.40	32.51	29.43	23.37	1.03	2.98	0.72	0.56	100

Table 1. Specific breed Ethogram: number of observations and frequency of each behavior category.

livestock). Successively the study of interactions with conspecifics, sheep and wild animals and assessment of their impact on wildlife and mountain tourism were evaluated. Obtained data about the dogs behavioural sequences, the total daily frequencies of each behavioural category and behaviour within each category were reported into an electronic database.

The results were subjected to statistical analysis, identifying significant differences between: sex, subjects and flocks, setting the level of significance at $p < 0.05$.

The normality of acquired data was assessed using the Kolmogorov-Smirnov

test. The comparison between two groups of subjects was performed using the Mann-Whitney U test, while the ANOVA Kruskal-Wallis test comparing data with more than two groups.

Results and Discussion

The breed specific ethogram and the subsequent dogs assessment were drafted using 1.947 data obtained from 1.472 observations. The behavioural categories more observed were position (32.51%), movement (29.43%) and searching (23.37%; Table 1).

The results show that dogs are within the flock in 74% of the time (attentiveness; Figure 2), 85% are

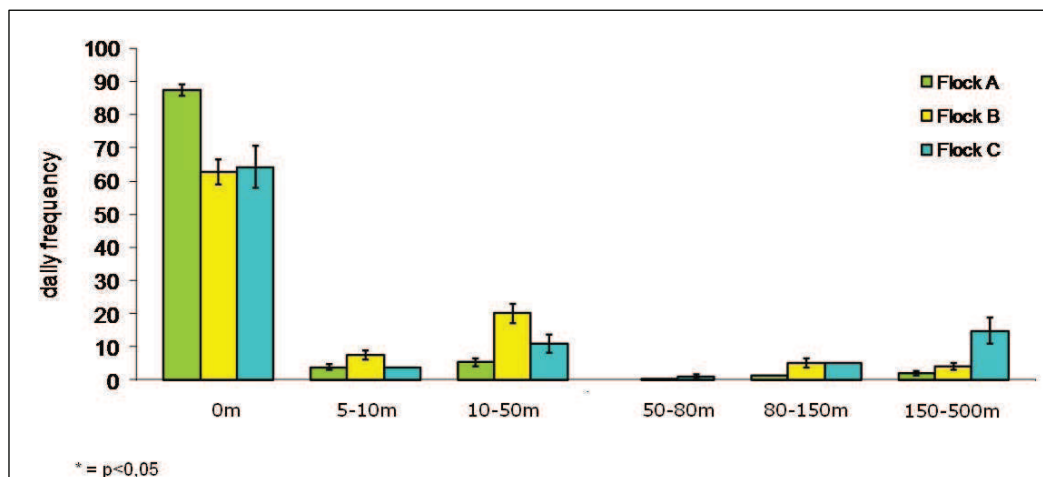


Figure 2. Attentiveness: analysis of distance.

protective (protectiveness; Figure 3) and none of the subjects showed aggressive behaviour directed to livestock (trustworthiness; Figure 4). Statistical analysis showed some significant differences in daily frequencies calculated for different behaviours. In the second part of the study the LGD behaviour was assessed in their working environment, recording interactions with other working dogs belonging to the flock (watch dogs), with tourists and wildlife .

Attacks towards conspecifics, as well as against tourists were very low (respectively 44% and 2%). Otherwise, the predatory attitude against a wild animal was predominant (91%) any wounds or captures and in 65% of observations the dog remained within 100 meters from the flock. The results of this preliminary study are in accordance with the literature, on the effectiveness

that is a LGD must spend approximately 85% of the time within the flock and the remaining 15% to control the surrounding area.

The stay inside the flock, coincides with an inactive attitude and with a light rest behaviour. Despite this, the dog is always alert and attentive to the environment and able to intervene in dangerous situations for the flock.

Conclusions

Based on the obtained and discussed results, from specific breed ethogram drafting was possible to assess a preliminary positive evaluation of these dogs, using them to protect livestock from predators attacks in an alpine area. Moreover, the aggressive behaviour directed to people or other dogs, the reaction to sudden situations

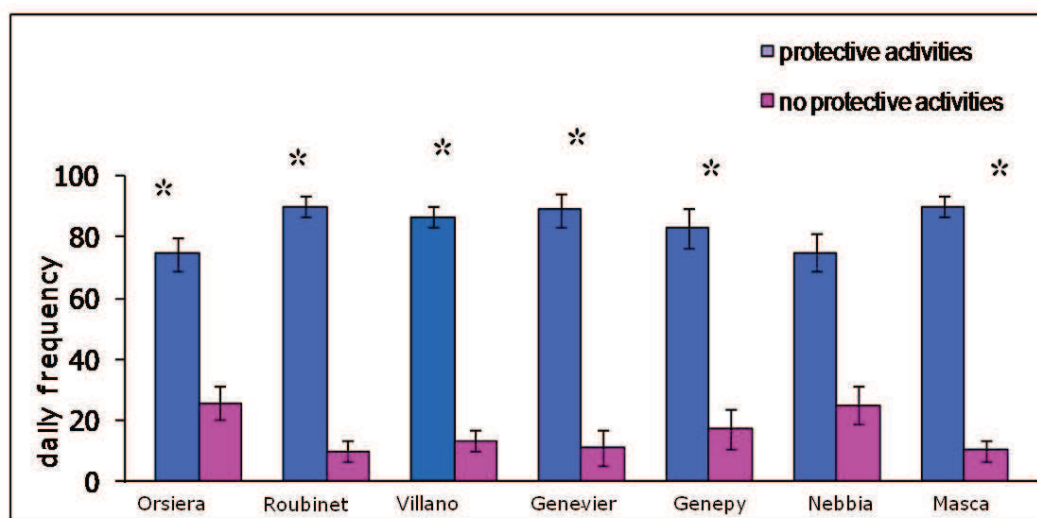


Figure 3. Protectiveness: analysis of activities (*= $p<0,0001$).

and the appropriate behavioural characteristics suggest a good LGD employment within mountain livestock farms.

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